DURHAM COUNTY

Triangle Wastewater Treatment Plant

PERFORMANCE ANNUAL REPORT

JULY 2020—JUNE 2021

Triangle Wastewater Treatment Plant
5926 NC Hwy. 55 E.
Durham, NC 27713
(919) 560-9033

Permits:

Wastewater Treatment Plant: NC0026051

Collection System: WQCS00038

Stormwater : NCG110054

Reclaimed Water: WQ0032821

Owned and Operated by:

Durham County Engineering & Environmental Services Utilities Division

Contact:
Stephanie Brixey
Deputy Director

Utility Workers, the Invisible Heroes

Utility workers often go unnoticed but nonetheless they are heroes. The best utilities are the ones we do not think about. You take a shower, wash clothes, flush your toilet, and the water drains away which is the way it should be. All the while utility workers are behind the scenes working during storms, natural disasters, holidays, and pandemics to ensure protection of public health and the environment, doing their jobs so well they're invisible.

Maintaining operations of the collection system and wastewater treatment plant is critical infrastructure that runs 24 hours a day, 365 days a year. The Covid-19 pandemic did not change that for Durham County Utilities. Under the Governor's Executive Order No. 124, Utilities was considered an essential business, and no permit waivers were granted by the NC Department of Environmental Quality (NCDEQ). The National Pollutant Discharge Elimination System (NPDES) permit and collection system permit requirements were to be followed as usual. Durham County's Utilities staff knew what was expected and willingly accepted all changes put in place to protect them and their families while still serving the residential, commercial, and industrial users within our service area. Some of the expectations included working staggard shifts and longer days to not only allow for social distancing, but also as a backup plan in case staff became sick. Operational and protective protocols already in place, were added upon to increase sanitary methods in order to minimize risk of exposure. Standard wastewater treatment and disinfection processes are effective at killing viruses including Covid-19.

Personally, I want to thank Durham County Utilities Staff which includes operations, maintenance, project management, laboratory, pretreatment, safety, administration, and supervisors for the work you do daily. Utility work is heroic, even if these heroes are best left unseen.

Collection System

Durham County owns and maintains a wastewater collection system which includes 105 miles of gravity sewer, 11 miles of pressurized force mains, and 13 pump stations.

In the past 12 months Durham County had one reportable spill.

- On April 21, 2021, a spill estimated at 374 gallons of wastewater occurred as a result of calcium carbonate build up within the system from a discharge from an industrial user.

The Durham County Utilities Division prides itself on providing a high level of customer service. All commercial, industrial, and residential customers' questions and concerns are responded to in a timely manner. If you have a question or concern regarding the collection system, services, or any item covered in this report, please call (919) 560-9033 or send an e-mail to utilities@dconc.gov.

Reclaimed Water

The Triangle Wastewater Treatment Plant (TWWTP) operates a reclaimed water system. Some of the uses of this water include: landscape irrigation, industrial cooling, industrial process water and sewer cleaning. Approximately 75 million gallons of reuse water was distributed to customers during the fiscal year.

- On September 23, 2020, there was a reclaimed water permit violation for exceeding the daily fecal coliform permit limit.

Projects & Rehabilitation

Throughout the last year, the County has continued its efforts to rehabilitate aging collection system infrastructure and increase sanitary sewer capacity to facilitate economic growth in our service area. Some of these completed projects include:

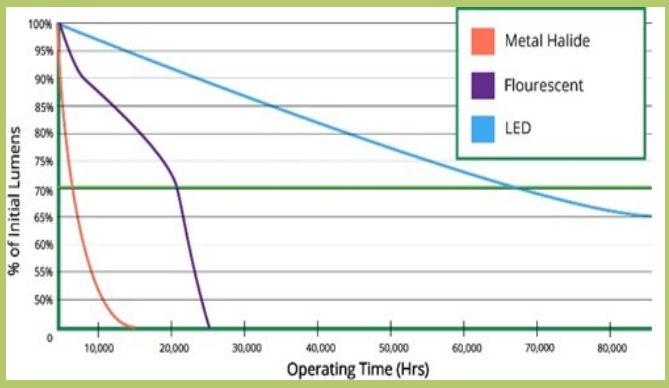
⇒ Davis Drive Pump Station - pump impellers, check valves, and draw tubes were replaced;

⇒ Fairfield Pump Station automatic recirculation valve (ARV) was replaced, plus two others within the system;

⇒ Ten manholes were rehabilitated;

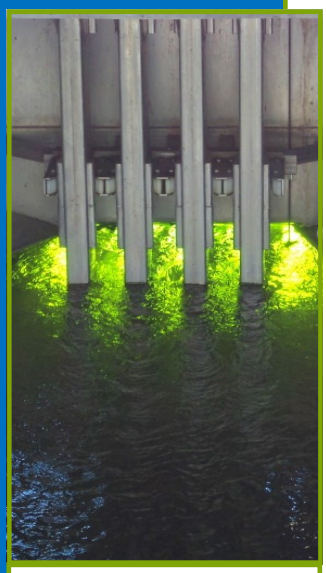
⇒ Completed stream bank stabilization to ensure the integrity of the sanitary sewer line near Chin Page Road and;

⇒ Twenty-seven (27) high bay 400-watt metal halide lights were replaced with 100-watt LED lights in the Filter Building at the TWWTP. The return of investment is thirty-nine (39) months with a total savings of $17,813 and 230,270 pounds of carbon dioxide (CO_2) saved over the next five years. The new LED bulbs will operate 80% longer than the metal halides.



Biosolids System

The TWWTP generates biological residuals (approximately 6,467 wet tons per year), which are dewatered by centrifuges. The dewatered cake (approximately 1,307 dry tons per year) is transported to McGill Environmental Systems, where it undergoes further biological treatment to produce a Class A biosolid. These biosolids are beneficially used as soil amendments in commercial landscaping and agricultural activities.



Ultraviolet (UV) System

In the past year, while treating 1.5 billion gallons of wastewater, the TWWTP was compliant in all sampling events except for one BOD violation.

Treatment System & Process

The **Influent Pump Station (IPS)** is used to pump raw wastewater (sewage) to the treatment process to be biologically treated. The IPS is sized for 12 million gallons per day average flow.

The **Fine Screens** are used to remove fine materials from the wastewater such as grit, sand, egg shells, etc. All of the organic materials are washed off and used in the biological treatment process.

The **Five Stage Biological Nutrient System** is where all biological treatment takes place, such as removing ammonia through nitrification and denitrification processes as well as the removal of phosphorus.

The **Chemical Polishing** process removes any phosphorus that is remaining after the biological treatment process. Methanol is used in this polishing process to add additional BOD to support the denitrification treatment process.

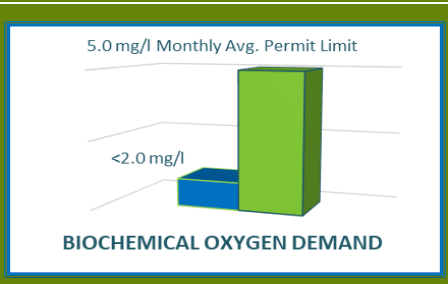
The **Clarifiers** are where the biomass is separated from the treated wastewater and then is returned to the BNR for further treatment.

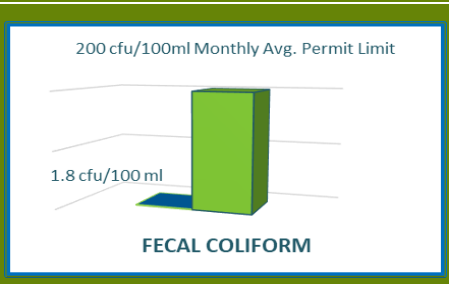
The **Tertiary Filters** are next in the clarification process which removes all remaining unsettled biomass in the treatment process.

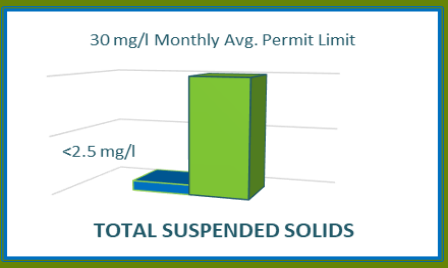
The **Ultraviolet Disinfection** treatment process is used to remove all disease causing bacteria without creating harmful by-products.

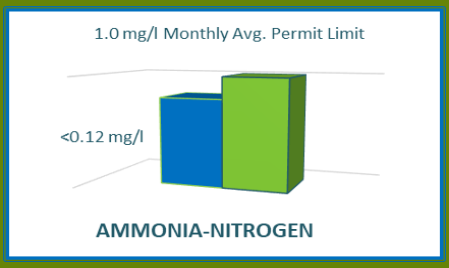
The **Reaeration** stage of the treatment process adds dissolved oxygen to the treated wastewater to meet required permit limits before it is discharged to Northeast Creek.

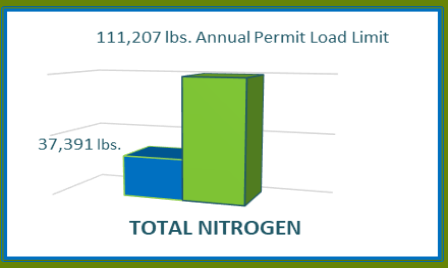
Effluent Annual Average Data

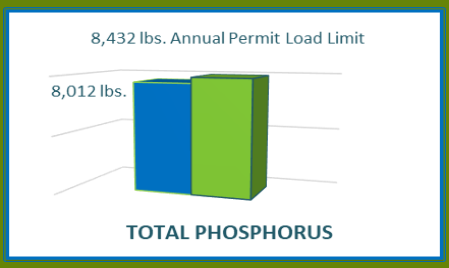












Clarifier

Lab & Pretreatment Program

The Triangle Wastewater Treatment Plant's (TWWTP) laboratory staff collects and analyzes wastewater samples as required by the NPDES permit and the reclaim water permit. Currently, the laboratory is certified by the Division of Water Resources Laboratory Certification Branch to analyze ammonia, biochemical oxygen demand, total residual chlorine, conductivity, dissolved oxygen, fecal coliform, pH, temperature, and total suspended solids. Staff determines the age and health of the activated sludge and identifies microorganisms, such as amoebae, bacteria, ciliates, flagellates, nematodes, rotifiers, and water bears.

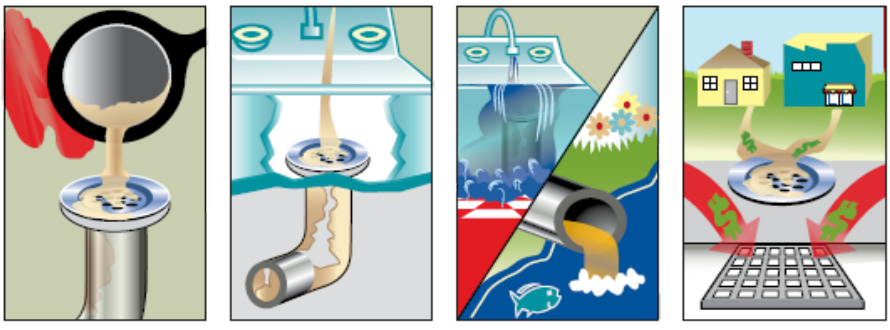
The TWWTP implements an Industrial Pretreatment Program (IPP) to control pollutants which may cause pass through or interfere with the treatment plant's processes, which may contaminate sewage sludge, or potentially be hazardous to worker's health and safety. Currently, there are sixty-seven permitted industries that are regularly inspected and monitored to ensure their discharges meet specific permit limits. Thirteen of these industries are Significant Industrial Users (SIUs). Biosafety Laboratories in our service area have also been identified and eighteen are currently permitted. Several of the Industrial Pretreatment Permit holders are required to certify that their facility has followed biosafety procedures consistent with the fifth edition of the Biosafety in Microbiological and Biomedical Laboratories, US DHHS -PHS, -CDC and -NIH for the deactivation of Biosafety Level 1, 2, 3 or 4 materials prior to discharge to the sewer system.

Glove Recycling Program

Durham County Utilities has partnered with RIGHTCYCLE* to reduce landfill waste by recycling gloves. During the second quarter of 2021, Durham County Utilities diverted forty (40) pounds of glove waste from the landfill by collecting used gloves and sending them to RIGHTCYCLE*, where the used products are sorted, processed into plastic pellets, and raw materials are molded into new consumer products.

Durham County is committed to vigorously pursuing sustainable practices in all operations and continue to make progress related to our environmental stewardship goals.

By putting Fats, Rags, Oils, and Grease down the drain, FROG builds up inside pipes and can cause a complete blockage. Clogged pipes overflow in your home and in the environment resulting in increased cost to residents due to repair and maintenance costs.



August 31, 2021

Notification:

This Performance Annual Report covering July 1, 2020 through June 30, 2021, was forwarded to the NC Department of Environmental Quality. Public Notice of the report was advertised in the Durham Herald Sun newspaper and is available for review at the following locations:

Clerk to the Board
200 East Main St.

Main Library
300 N. Roxboro St.

South Regional Library
4505 S. Alston Ave.

Website
www.dconc.gov/utilities

Certification:

I certify under penalty of law that this report is complete and accurate to the best of my knowledge. I further certify that this report has been made available to the users or customers of the named system and that those users have been notified of its availability.

Stephanie Brixey
Deputy Director